

Editorial

Technology Enhanced Learning in the Workplace

Heather Short and Sue Greener

This Special Issue of the British Journal of Educational Technology (BJET) is devoted to Technology Enhanced Learning (TEL) in the workplace. Following a stream devoted to this subject at the University Forum for Human Resource Development Conference in 2013, we wanted to stimulate discussion on the use of such technology as part of learning in work situations. Therefore, this issue brings together contributions that provide relevant and current thinking about such learning, evidence of how it occurs and theoretical frameworks to enable its use.

In 2006, Latchem undertook a content analysis of this journal, looking at editorials, refereed articles and colloquia in 31 issues of the publication between January 2000 and November 2005. Of these 374 items, only 3% were from "*colleges, industry and the 'learning and skills sector'*" (Latchem, 2006, p507), - the 'learning and skills sector' included places of work-based learning, using the definition supplied by the British Educational Communications and Technology Agency (BECTA), (BECTA, 2005), the then British government agency leading the national drive to ensure the effective and innovative use of technology throughout learning. This low input from non-academic organisations was despite, as Latchem noted, many editorial reminders. For example, Rushby's January 2004 editorial (Rushby, 2004) stressed that BJET is as much for trainers in workplace settings as it is for those in academia. Consequently Latchem's first conclusion was that BJET should aim to include more papers on educational technology in the workplace. Although it is not until now that a whole issue has been devoted to this subject, we hope that the articles in this Special Issue will encourage further dialogue and submissions on workplace TEL.

Workplace Learning in Practice

Most people learn at, or through, work rather than by way of formal education courses - and yet, as Latcham (2006) shows above, literature relating to TEL in the workplace has paid scant attention to this. This Special Issue aims to bridge that gap by addressing Latchem's call for BJET to include more workplace learning articles in order to help "*translate rhetoric into action and research into practice*" (p510).

With its advantages over traditional face-to-face training, in respect of saving time, money and travel and being flexible, easily-accessible and capable of being personalised for individual learning styles (Honey & Mumford, 1992; Kubicek, 2004 and Mitchell, 2010), TEL appears to be an ideal enabler of workplace learning. Furthermore, it can overcome the difficulties of scheduling and funding training in small businesses and / or remote locations, as illustrated by Sambrook in her study of e-learning in SMEs in North Wales (2003a) and as also shown by Goggins' *Designing CSCL at Work for Rural IT Workers: Learning Ensembles and Geographic Isolation* which looks at workers in small technology firms across rural America (in this issue).

There is a need for improved workplace learning as highlighted by PriceWaterhouse Coopers' international survey of 1,300 Chief Executives which found that 65% of UK

leaders think that employees' lack of skills is hampering their companies' growth (CIPD, 2013a). However, Wang (2011) considers that current TEL programmes fail to systematically align the learning with the organisation's goals and the individual's needs, which could hamper both organisational and personal growth. Instead, Wang claims, such programmes focus on the technology rather than the trainees' needs and subsequently deliver low quality, badly designed training which does not achieve its goals. This point is illustrated by de Brito Neto, Smith & Pedersen's *E-Learning in Multi-Cultural Environments: an analysis of Online Flight Attendant Training* which examines online flight attendant training in multi-cultural environments and shows that, however technological and interactive training can be made to be, ignoring language and culture is counterproductive. Similarly Gamrat, Zimmerman, Dudek & Peck's *Personalized workplace learning: An exploratory study on digital badging as a teacher professional development program*, which explores digital badging in teacher professional development in a school in USA, observes the importance of personalising a school's online learning to fit its culture.

This brings into question what we consider TEL to be. Much of the literature on TEL at work seems to ascribe e-learning at work to the provision of direct alternatives to traditional training packages, in other words to attempt to move training onto an online platform. There are many excellent examples of where and how this can be done, particularly where funds are not a barrier, but there is a potential pitfall here, one which, in Higher Education, has been increasingly recognised. Just like business organisations, universities and colleges have tried to use virtual learning environments to offer substitutes for classroom experiences, often simply migrating lessons and units into an online format. This not only may not be the best use of the technologies, it also moves all the downsides of current face-to-face training or learning experiences into an online structure. By seeking to mimic the face-to-face learning experience online, we create problems of accessibility, of pedagogy and of learner engagement. Rather than recreating a class online, we should seek to understand better the advantages of learning technologies, using them to add value to whatever face-to-face learning interactions are available. If that means using learning technologies to enhance intra-site or inter-site communication, to provide instant look-up and search facilities to knowledge stored somewhere in the organisation, to facilitate the working of cross-departmental task and quality groups or to support mentoring or coaching relationships which may otherwise fail due to timetables and time zones, then that, in our view, is a great approach to TEL at work and one which enhances work-based learning.

Is a blended approach best?

The practice of considering technological possibilities rather than people's learning needs may explain why the UK's Chartered Institute of Personnel and Development (CIPD) / Cornerstone's 2013 survey showed that merely 15% of the organisations which replied to their questionnaire consider TEL (though they refer to it as e-learning) to be one of the most effective learning methods available to them. However, to put this in perspective, this belief in TEL's effectiveness had grown from 7% in their 2009 survey (CIPD, 2013b). This aligns with Admiraal & Lockhorst's (2009) survey of over 400 SME owner-managers across seven European countries and subsequent interviews with owner-managers and employees from more than a quarter of these, which showed a predominantly negative attitude towards technology and learning.

Furthermore, the CIPD's 2013 survey showed that face-to-face training was considered much more effective than virtual training, with 48% favouring in-house development programmes

and 39% preferring coaching by line managers (CIPD, 2013b). However, the survey also showed that 91% of organisations taking part believed that e-learning was most effective when combined with other learning methods, with 72% stating that TEL should not be regarded as a *substitute* for face-to-face training. While there is widespread evidence that TEL is seen as useful in compliance and induction training, its use elsewhere is, at best, spasmodic. Consequently, Raymond, Uwizeyemungu, Bergeron and Gauvin (2012) view TEL as an appealing supplement to traditional training methods, noting an increase in blended learning, which aligns with the CIPD 2013 survey results. Furthermore, Garavan, Carbery, O'Mally and O'Donnell (2010), having studied 275 Irish organisations (of all sizes) which provided e-learning for their employees, agreed that TEL should be used in conjunction with other learning methods, attesting that “*e-Learning now forms an important component of training provision in organizations*” (p155).

These sources suggest that learning technologies are best used alongside traditional forms of Human Resource Development (HRD), but do not necessarily point to blend. Further work is needed to explore the integration of learning technologies with other forms of work-based learning to see how a blend can produce added learning value. Current examples are often based on guesswork as to how often groups or coach/learner dyads should meet face to face and therefore what proportion of online communication can supplement learning effectively. Equally such examples of HRD intervention are often based on behaviourist principles of learning which produce short-term outcomes of knowledge acquisition rather than constructionist and evaluative behaviours which will benefit business organisations in the longer term. Blend is not about somehow mixing the ingredients of face-to-face and online learning to achieve a sum of the parts, but about producing greater or more effective learning than that achieved by one method alone. This can be seen in Dzung, Lin and Wang's article (*Building a construction procurement negotiation training game model: Learning experiences and outcomes*) where an educational game is used to supplement traditional lectures.

Sociological Factors and Communities of Practice

As discussed above, it is clear that sociological factors must be considered when undertaking TEL in the workplace, for example, Short's article (*A Critical Evaluation of the Contribution of Trust to Effective Technology Enhanced Learning in the Workplace: a Literature Review*) concentrates on the effect which trust has on such learning. In this, she examines barriers to the development of trust in TEL and factors which encourage such trust, before suggesting ways to make TEL more effective in the workplace. Trust is also a factor which Ley, Cook, Dennerlein, Kravcik, Kunzmann, Pata, Purma, Sanders, Santos, Schmidt, Al-Smadi & Trattner (*Scaling Informal Learning at the Workplace: a Model and Four Designs from a Large-Scale Design-Based Research Effort*) examine in their investigation into scaling informal learning in the workplace and they explore how learners develop trust in both documents and people.

Through the examination of TEL in the workplace in this issue, we have extended the understanding of the social and relational features of learning, whether this is undertaken formally, as shown by de Brito Neto, Smith & Pedersen, or informally, as illustrated by Gu, Churchill & Lu (*Mobile Web 2.0 in the Workplace: A Case Study of Employees' Informal Learning*), although Za, Spagnoletti & North-Samardzic (*Organisational learning as an emerging process: the generative role of digital tools in informal learning practices*) claim that informal learning can be more significant than formal in workplace settings .

Having discussed how TEL is more effective when the learners' requirements, rather than the technology's capabilities, are considered, one of the most interesting themes to emerge from the articles in this Special Issue is that often in TEL in the workplace, the emphasis is not on the technology itself, but on how that technology enables relationships between people to develop. This is shown by Ley et al and by Mellett & O'Brien's *A strategy and models to assist Small and Medium Enterprises (SMEs) with the implementation of eLearning in Europe*.

Although the article by Short largely concentrate on the relationship between students and trainer as well as among students in a workplace learning environment, several of the other authors talk about relationships between co-workers and co-learners. Indeed many of the authors, such as Tynjala, Hakkinen & Hamalainen (*TEL@Work - towards Integration of Theory and Practice*) and Gu, Churchill & Lu discuss the networks which are established between workers who are learning together and how these networks are enabled by the technology.

According to Wenger (1999), Communities of Practice are based on the assumption that engagement in social practice is the fundamental process by which we learn and become who we are. Hamburg and Hall (2008) advocate "*virtual Communities of Practice*" (page 200) for innovation and growth within the workplace, particularly in SMEs, as workers can learn from, and with, others who have similar problems, experiences and interests and thus they can develop a "*knowledge base of best practices*" (page 7). Such communities occur in many of this issue's articles, for example Goggins refers to "*networks of practice*", "*virtual communities*" and "*virtual organizations*", showing how these have been enabled by the use of technology in workplace learning being undertaken by the remote USA technology workers he is investigating. As mentioned above, Tynjala, Hakkinen & Hamalainen identify TEL resulting in online communities, as do Ley et al and Mellett & O'Brien, who observe that such networks seem to be particularly common in SMEs.

Is organisation size important?

Often, research into the workplace concentrates on large companies, rather than looking at SMEs (Beaver & Hutchings, 2005; Jones, 2005; Brock, 2000) so the increased focus in this issue on SMEs will, we hope, begin to redress the balance. This is especially pleasing as authors such as Admiraal & Lockhorst (2009) have pointed out that, although TEL has had a big impact in large companies, this does not apply in SMEs where both technology and the attitudes of owners and staff have been major barriers to its successful implementation. They do, however, think that TEL's immediacy fits in well with the typical SME profile. Similarly Raymond et al (2012) accept Liang, Saraf, Hu & Xue's (2007) assertion that the advantages of IT can only be realised in businesses where it is fully integrated with all aspects of the enterprise and consequently they seek to integrate various factors into a useful framework for TEL within SMEs. Factors which are considered include the owner-manager's orientation towards technology and the competencies existing within the organisation. Although Sambrook (2003b) considers that TEL could overcome the shortcomings of SMEs' lack of Human Resource Development infrastructure and also the problems of remote locations, she argues that difficulties in ascertaining the full cost of TEL can inhibit SMEs' uptake of it. Salmon (2011) also thinks that the cost aspects of TEL can deter SMEs, noting that, although technology is becoming more available and affordable, high quality equipment remains expensive, which may preclude it from many SMEs' budgets. However, Hamburg and Hall

(2008) proclaim that TEL is well suited to SMEs' informal style, with its focus on community also appealing to the interest in group learning which many SMEs have, as discussed above.

Examples of TEL in SMEs in this issue include Ley et al's examination of a network of SMEs in the building and construction industry in Germany and Goggins' research into rural technology SMEs in America. Additionally Mellett & O'Brien investigate the suitability of adapting e-learning models used in SMEs in Canada for comparable organisations in Ireland, although they find differences in the size of SMEs between the two countries. Interestingly Lee, Zo & Lee look at both large companies and SMEs in various industries in their *Smart Learning Adoption in SMEs and Large Enterprises: the HRD Manager Perspective* and their analysis aims to distinguish between smart learning in the two types of organisation.

Are employees reluctant to use TEL?

With its potential for flexible learning, TEL would appear to have many attractions for employees, especially as many of them need to undertake continuous learning to enhance their marketability and to remain attractive to current and future employers (Scholarios, Van der Heijden, Van der Schoot, Bozionelos, Epitropaki, Jedrzejowicz, Knauth, Marzec, Mikkelsen & Van der Heijde, 2008; Littleton, Arthur, & Rousseau, 2000). Therefore it may be surprising that many of them do not complete such training. This is evidenced by the UK CIPD 2013 survey which highlights that, although 72% of organisations which use e-learning offer it to most of their employees; only 31% of those organisations say that the majority of their employees *completed* online courses. However, this was an improvement on the 23% completion rate reported in their 2011 survey (CIPD, 2011; CIPD, 2013b). This echoes the UK National Air Traffic System (NATS) where e-learning achieves only 10%-30% completion rates. This low figure is largely attributed to employees' reluctance to complete training in their own time and / or at home (Crush, 2012). However, Garavan et al's (2010) study of 275 Irish e-learning-using organisations found that employees' motivation to learn is key to TEL's success. It is remarkable that none of the articles in this Special Issue highlight this concern about low TEL completion rates, a subject which is of increasing focus in the Higher Education literature in relation to Massive Open Online Courses (MOOCs) where similar drop out rates apply. Further research in this area is vital, particularly to consider whether dropout rates correlate with a degree of familiarity with the subject content. MOOCs are particularly successful where subject matter is outside the experience of the learner and many current MOOC participants use them as exploratory learning experiences. Could this mean that in workplace learning, where subject content is brand new for the learner, and possibly of a higher technical level than previously experienced, we could expect higher completion rates, but where content is refresher learning (for example developing skills such as equality and diversity awareness and supervision and management training) there is a higher expectation of dropout?.

Help and Support

However, the issue of the support needed both by workplace learners, and in TEL in general, is raised by many of this issue's authors. Goggins stresses its importance to the geographically-dispersed USA IT workers he is researching, as do Gamrat et al in respect of the USA school-teachers using digital badging who they are investigating, while Short considers that support is particularly important in establishing trust when implementing TEL in workplace settings.

Workplace learning tends to be focussed on practical outcomes and so this issue includes several articles which give advice on how to use TEL more effectively in the workplace. Examples of this include Gegenfurtner, Quesada-Pallares & Knogler's evidence of 32 instructional characters which can be used to improve digital simulation-based training and their finding that offering feedback after, rather than during, training can improve self-efficacy and the transferability of the skills (*Digital Simulation-Based Training: A Meta-Analysis*). De Brito Neto, Smith & Pedersen's clear directive to consider culture and language when designing e-learning and Short's guidelines for establishing and growing trust during TEL in the workplace should also be helpful. Additionally Tynjala, Hakkinen & Hamalainen's investigation into the integration of theory and practice consequently shows two ways of applying their model, one when designing technologies and the other to adapt existing technologies for learning at work.

Diverse articles, common themes

The articles within this issue clearly show the diversity of TEL applications that promote new tools for learning, new places of learning and new opportunities for learning. While all the articles are concerned with TEL in the workplace, they cover a wide variety of industries in many different areas of the globe, special areas of interest and different methodologies. For example Gu, Churchill & Lu's multiple case studies investigate the use of smart phones in various sectors of the workplace in China, Goggins' ethnographic and action learning research examines issues of collaboration and isolation for rural IT workers in USA SMEs and de Brito Neto, Smith & Pedersen's questionnaire explores multi-cultural issues arising from online flight attendant training while Dzung, Lin and Wang investigate construction procurement and negotiation game-based learning in Taiwan. Additionally Gegenfurtner, Quesada-Pallares & Knogler's extensive meta-analysis of 15 studies carried out over two decades involves a total sample size of 2,274 workplace learners across multiple industries, including the military and air traffic controllers.

Despite the diversity of the articles, several themes emerge, as has been discussed above. Additionally the articles emphasise that TEL and workplace learning share many characteristics, such as informality. Often, workplace learning is seen as informal (Thomas & Akdere, 2013) and several authors, including Tynjala, Hakkinen & Hamalainen, de Brito Neto, Smith & Pedersen and Goggins, show how well suited this is to TEL. Also Garavan et al (2010) emphasise the need for flexibility in workplace learning and Gamrat et al, Gu, Churchill & Lu and Mellett & O'Brien show how TEL can meet this requirement as well. This emphasis away from traditional "course" type learning can only benefit our understanding of workplace learning.

Where, How and Who

The overall aim of this Special Issue is to show that technology in workplace learning is an exciting area to research, as well as highlighting the valuable contribution that learning technologies can make to workplace learning in general. The papers in this Special Issue offer important insights regarding where learning takes place, how it occurs and who is learning. They draw attention to new issues and areas and provide a compelling basis for future research and practice development.

In 2010 Dexter and Dornan espoused that “*Today’s pace of change is so fast that talking about web-based learning will very quickly become as absurd as talking about printing press-based – as opposed to quill-based – learning*”(Dexter and Dornan, 2010, p746). However, we are quite a way from that vision, and the issue of the take-up of TEL in the workplace being lower than expected (CIPD, 2013b) deserves further investigation. The development of TEL is still very much a work in progress for both scholars and practitioners and we look forward to reading more about this in future issues. We hope that not only will this Special Issue lead to a growth in workplace TEL, but also that it will inspire more people to submit such research to this journal.

Finally, we would like to express our thanks to the authors and referees who have contributed to this Special Issue and particularly we would like to thank Nick Rushby for all his help and support in preparing it.

Biographies

Heather Short (Heather.short@port.ac.uk) is a PhD student at the University of Portsmouth, investigating issues of trust in Technology Enhanced Learning (TEL) in the workplace, especially in SMEs. She has many years of experience of both the workplace and TEL, firstly with a multi-national technology company and then as an SME owner-manager. A paper based on her MBA dissertation investigating virtual learning in SMEs was shortlisted for the Alan Moon Memorial Prize at UFHRD (University Forum for HR Development) 2012. She co-chaired the Technology Enhanced Learning at Work stream at UFHRD 2013, where she also presented a paper.

Dr Sue Greener BA, MBA, EdD, FHEA, Chartered Fellow CIPD (S.L.Greener@brighton.ac.uk) is a Principal Lecturer at Brighton Business School, University of Brighton. She conducts research in the fields of technology enhanced learning, blended learning and reflective learning and is particularly interested in developing teachers’ and trainers’ interest and competencies in these areas. She is editor of the journal *Interactive Learning Environments*. Sue leads university programmes including Foundation Degree Business, BSc Business with Enterprise, and Joint Honours Programme Business Pathway. She also teaches a fully online course in Research Methods and is Subject Examiner for a Business distance learning examination.

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